

A NEW GENUS OF PSILOPINE FLIES (DIPTERA: EPHYDRIDAE) WITH NOTES ON ITS RELATIONSHIPS

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ABSTRACT—*Nesopsilopa* new genus with *stonei* new species, *bahamaensis* new species, type-species *umbrosa* (Loew) new combination, *caeruleiventris* (Loew) new combination, and species A are described from several Caribbean Islands and southern Florida. *Guttipsilopa* Wirth is also reviewed. Characters of the head, wing, and male genitalia are figured. *Nesopsilopa* and *Guttipsilopa* are placed in Psilopinae where they are intermediate between the tribes Psilopini and Discocerini. Characters for tribal recognition are discussed and it is provisionally suggested that Discocerini and Psilopini be combined.

When Cresson (1946) revised the Neotropical species of the subfamily Psilopinae, he provisionally placed *Psilopa umbrosa* Loew and *P. caeruleiventris* Loew in the genus *Rhysophora* Cresson. Cresson recognized that these two species could not be retained in the genus *Psilopa* Fallén, as then characterized, and for lack of a better generic association, he assigned them to *Rhysophora*. Cresson (1946:152) stated further, however, that both species “. . . may prove to be entitled to separate generic recognition, allied to the Oriental *Actocetor*.” Ten years later, Wirth (1956) proposed the monotypic genus *Guttipsilopa* for his new species *G. haydeni*. Wirth suggested that *Guttipsilopa* was allied with the genera *Actocetor* Becker (Old World) and *Trypetomima* de Meijere (Australasian), and he pointed out that these genera plus *Guttipsilopa* all had guttate wings and chaetotaxy similarities. Our purposes in the present paper are to present our interpretation of the taxa in question and review the New World species.

METHODS

The genera considered below are rare and are not well represented in collections. Our study was based on less than 30 specimens, of which 21 represented 1 species. Because of their rarity, we have cited the locality data and depository of each specimen.

Ratios have been used objectively to define three characters: Face width is expressed as a ratio of face width divided by head width, where the narrowest

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distance between the eyes is the face width measurement and the widest distance of the head is the head width measurement. The costal vein index is the straight line distance between $R2 + 3$ and $R4 + 5$ divided by the distance between $R1$ and $R2 + 3$. The $M1 + 2$ vein index is the distance along the medius basad of tp (posterior crossvein) divided by the distance apicad of tp .

Nesopsilopa Mathis and Wirth, new genus

Type-species: *Psilopa umbrosa* Loew, by present designation.

Diagnosis: *Nesopsilopa* may be distinguished from related genera of the subfamily Psilopinae by the following characters: Body mostly brown to black; mesonotum, scutellum, and head heavily pollinose, gray to brownish gray; 2 pairs of proclinate fronto-orbitals, anterior pair much larger; 1 pair of reclinate fronto-orbitals situated caudad and mesad of the larger pair of the proclimates; post-ocellar bristles arising from points in line with posterior margin of posterior ocelli, proclinate; basal alignment of ocellar bristles variable; antennal arista with 5-9 branches; paired facial bristles numbering from 3-5; parafacies bare; genae narrow; less than $\frac{1}{4}$ eye height; notopleuron bare except for 2 pairs of large bristles; prescutellar bristles aligned approximately with intra-alars and posterior supra-alars; wing maculate, anterior margin infuscated; venation normal.

Description: Small flies, 2.73 to 4.00 mm long; generally dark colored although with gray, densely pollinose areas on head and thorax; wing maculate.

Head: Frons rectangular, wider than long, pollinose; ocellar triangle equilateral or isosceles; 3 fronto-orbitals, 2 laterally-aligned proclinate bristles and between them 1 reclinate bristle equal to length of verticals and arising slightly closer to anterior proclinate bristle; anterior proclinate bristle approximately twice the size of the smaller posterior proclinate; 1 pair of large, proclinate, parallel, ocellar bristles situated slightly anterior, laterad, or slightly posterior to anterior ocellus; postocellar bristles small, diverging, proclinate, and slightly larger than posterior proclinate fronto-orbital; inner and outer vertical bristles subequal to each other in size. Antenna entirely pale yellow; 2nd segment spinose, with 1 slightly larger bristle arising from anterodorsal surface; arista with 5-9 branches. Face much longer than wide, generally flat although protruding slightly toward lower $\frac{1}{2}$ and slightly receding toward oral margin; 3-5 large facial bristles and several smaller, incurved setae between larger bristles and parafacial suture; parafacies bare, linear, and narrow, enlarging only slightly around lower margin of eye. Eyes bare, oval, aligned perpendicular to plane of epistoma; gena narrow, less than $\frac{1}{4}$ eye height, and with several smaller setae and 1 or 2 larger bristles. Maxillary palpus mostly yellowish orange to yellow; clypeus exposed; concolorous with face; oral opening small.

Thorax: Mesonotum and scutellum densely pollinose, contrasting distinctly with pleuron which is more or less bare and shining. Chaetotaxy as follows: Several un-seriated rows of setae throughout acrostichal and dorsocentral areas, this area lacking any larger bristles except for 1 pair of prescutellars that are situated in line with a large pair of intra-alars and the posterior pair of supra-alars; anterior pair of supra-alars larger; 2 pairs of marginal scutellar bristles; disc of scutellum setulose; 1 pair of humerals; 2 pairs of notopleurals, both equally distant from notopleural suture, anterior bristle slightly closer to posterior bristle than to humeral bristle; 1 pair of presuturals; 2 pairs of mesopleurals, and 1

pair of sternopleurals. Legs dark brown to black basally, becoming paler toward apices, generally 3 to 4 tarsomeres yellow. Wing maculate, infuscation limited to anterior half; costal vein extending to $M1 + 2$; $R2 + 3$ nearly straight. Halter dark basally, becoming paler apically, capitellum white.

Abdomen: Dark brown to bluish black, subshining to distinctly shining with metallic reflections. Males with 5 visible segments, females with 6 to 7, sometimes the latter are telescoped into the 5th.

Distribution: The genus is restricted to the Western Hemisphere, with species known from the Greater Antilles and southernmost Florida.

Natural History: The immature stages are unknown. Adults are found on sea beaches, notably where seaweeds have washed ashore. A few adults were swept from two plant species of the family Asteraceae: *Borrichia arborescens* (L.) DC. (Sea Oxeye), and *Flaveria linearis* Lag. (Yellowtop). These plants grow on sea beaches and in hammocks or mangrove swamps.

Etymology: *Nesopsilopa* is of Greek derivation and is a combination of the feminine Greek noun *neso* meaning "island" and *Psilopa*, in reference to the island habitat of the *Psilopa*-like flies.

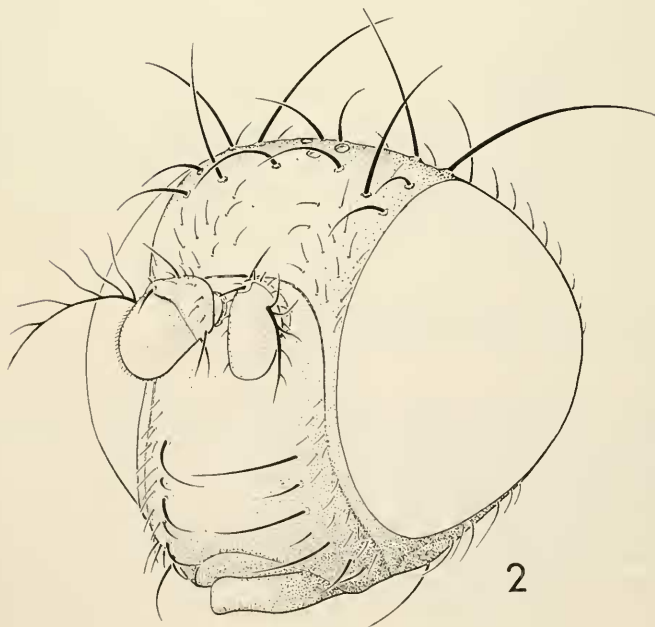
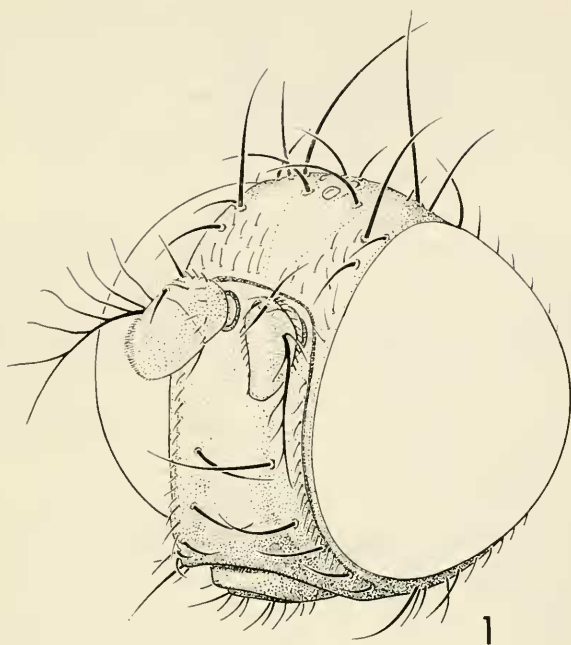
Discussion: Both previously described species of the genus *Nesopsilopa* were placed in *Rhysophora* (Cresson, 1946; Wirth, 1968). We are transferring these species to *Nesopsilopa* because of numerous dissimilarities between them and the type-species of *Rhysophora*, *robusta* Cresson. In general, *Rhysophora* is almost entirely dark brown to black, notably the antennae, and lacks dense pollinose areas over much of the dorsal surface of the head and thorax. In addition, the wings of *Rhysophora* are hyaline; the smaller proclinate fronto-orbital is very much reduced or is lacking; if present, it is inserted anterior or laterad of the reclinate fronto-orbital, never posterior of it; the arista has 9–11 branches (Notiphiline type); and the postocellars are relatively small and are laterocline.

Nesopsilopa caeruleiventris (Loew), NEW COMBINATION
fig. 5

Psilopa caeruleiventris Loew, 1862:144.

Rhysophora caeruleiventris (Loew); Cresson, 1946:152; Wirth, 1968:12.

Diagnosis: *Nesopsilopa caeruleiventris* is the largest species in the genus and can be confused only with *N. bahamaensis*. It is distinguished from *N. bahamaensis*, as well as other congeners, by the following characters: Length 4.0 mm, robust; ocellars inserted laterad of anterior ocellus; antennal arista with 8–9 branches; face wide, head-width to face-width ratio 1 : 0.35; 4 pairs of larger facial bristles, uppermost pair well above middle of face and distinctly separated from remaining facial bristles; parafacies moderately narrow, mostly linear, slightly enlarging along ventral margin of eye, eye to cheek ratio 1 : 0.14; anterior margin of wing infuscated, dark brown, posterior margin of infuscation distinct, sinuate, macula-



Figs. 1-2, oblique view of head. 1, *Nesopsilopa stonei*. 2, *Nesopsilopa umbrosa*.

tion pattern as in fig. 5; hind crossvein whitish; costal vein index 1 : 0.45; M1 + 2 vein index 1 : 0.74; scutellum dark brown, contrasting distinctly with grey mesonotum; abdomen bluish black, shining, metallic.

Type and Type-locality: Female holotype: "207; Loew Coll.; Type 12045 [red]; *Psilopa caeruleiventris* det. Cresson, 1921; *Rhysophora caeruleiventris* (Lw.) WWirth '61; *Nesopsilopa caeruleiventris* (Loew), Mathis & Wirth, 1977." The holotype is in the Museum of Comparative Zoology, Harvard University, type number 12045. Loew's original description of this species lists "Cuba" as the type-locality; no label indicating such presently accompanies the holotype.

Nesopsilopa bahamaensis Mathis and Wirth, new species
fig. 4

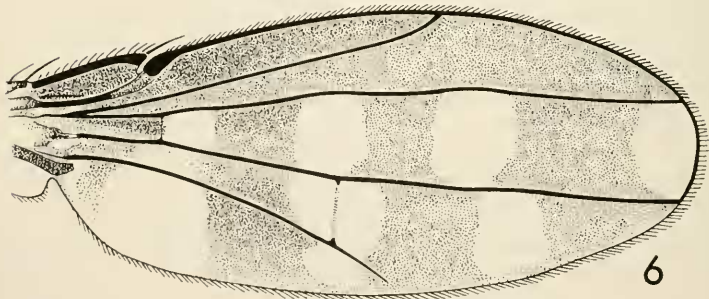
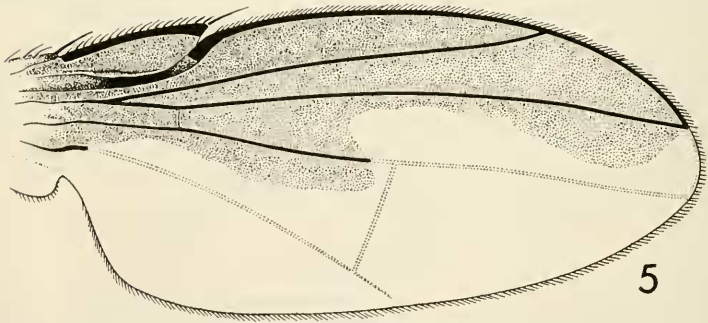
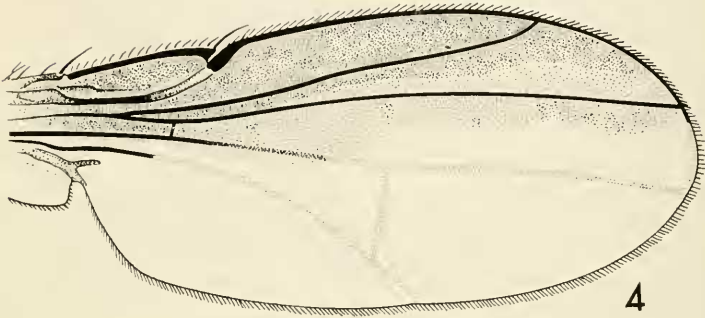
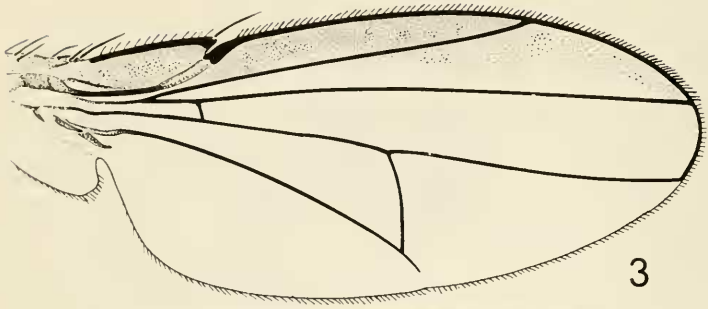
Diagnosis: *Nesopsilopa bahamaensis* is similar to *N. caeruleiventris* but can be distinguished from it and other congeners by the following characters: Length 3.5 mm; ocellars inserted laterad of anterior ocellus; antennal arista with 8-9 branches; face wide, head-width to face-width ratio 1 : 0.42; 4 pairs of larger facial bristles, uppermost pair well above middle of face and distinctly separated from remaining facials; parafacies moderately narrow, enlarging slightly along ventral margin of eye, eye to cheek ratio 1 : 0.13; anterior margin of wing infuscated, brown, posterior margin of infuscation indefinite, blending gradually with hyaline posterior half of wing; maculation pattern as in fig. 4; hind crossvein whitish; costal vein index 1 : 0.51; M1 + 2 vein index 1 : 0.90; scutellum concolorous with mesonotum; abdomen bluish-black, shining, metallic.

Type and Type-locality: Female holotype: "Grand Bahama Isl., West End, May 12, 1953; Van Voast—A.M.N.H., Bahama Isls. Exped., Coll. Hayden, Giovannoli & Rabb; HOLOTYPE *Nesopsilopa bahamaensis* Mathis and Wirth [red]." The holotype will be deposited in the American Museum of Natural History, New York.

Nesopsilopa stonei Mathis and Wirth, new species
fig. 1, 13-14

Diagnosis: This species is closely related to *N. caeruleiventris* on the basis of overall similarity and can be distinguished from that species as follows: Length 2.92 mm (holotype), less robust species; ocellars arising laterad or very slightly caudad of alignment of anterior ocellus; antennal arista with 7-9 branches; face narrow, head-width to face-width ratio 1 : 0.31; 4 pairs of larger facial bristles, the uppermost pair located above middle of face and well separated from lower pairs; parafacies very narrow, linear, eye to cheek ratio 1 : 0.07 (holotype); anterior margin of wing infuscated, dark brown; hind crossvein whitish; costal vein index 1 : 0.62; M1 + 2 vein index 1 : 0.71; abdomen shining with metallic bluish-black reflections; male genitalia as in fig. 13-14.

Types and Type-locality: Male holotype: "Petionville, 1000 ft., Haiti; WBHeed, HLCarson, Jun Jul 1959; HOLOTYPE *Nesopsilopa stonei* Mathis & Wirth [red]." Allotype: "Guajataca Forest, Isabela,



Figs. 3-6, wing. 3, *Nesopsilopa umbrosa*. 4, *Nesopsilopa bahamaensis*. 5, *Nesopsilopa caeruleiventris*. 6, *Guttipsilopa haydeni*.

P R (Puerto Rico), 22 July 1955. Collected at light.; Ramos & Maldonado Collectors; ALLOTYPE *Nesopsilopa stonei* Mathis & Wirth [red].” The holotype and allotype are in the National Museum of Natural History, Washington, D. C., type number 74003.

Remarks: It is our distinct privilege to name this new species after Alan Stone, eminent dipterist, abettor, and friend.

Nesopsilopa umbrosa (Loew), NEW COMBINATION

fig. 2-3, 9-10

Psilopa umbrosa Loew, 1862:143.

Rhysophora umbrosa (Loew); Cresson, 1946:152 (as *unbrosa*); Wirth, 1968:12.

Diagnosis: This species resembles *Nesopsilopa* species A but is distinguished from it and other congeners by the following characters: Length 2.73-3.06 mm; ocellars arising slightly cephalad of anterior ocellus; antennal arista with 5, sometimes 6, branches; face wide, head-width to face-width ratio averaging 1 : 0.40, lower $\frac{1}{2}$ with slight prominence; 3-4 pairs of larger facial bristles, upper pair just below middle of face; parafacies narrow although wider than in *N. stonei*; eye to cheek ratio averaging 1 : 0.20; wing (fig. 3) infusate in only 1st and 2nd marginal cells, light brown; costal vein index averaging 1 : 0.67; M1 + 2 vein index averaging 1 : 0.68; abdomen subshining to shining, blackish brown; male genitalia as in fig. 9-10.

Type and Type-locality: Female holotype: “Cuba. [green]; Loew Coll.; umbros.; Type 1144 [red]; *Nesopsilopa umbrosa* (Loew), Mathis & Wirth, 1977.” The holotype is in the Museum of Comparative Zoology, Harvard University.

Remarks: This is the only “common” species of the genus. Data for specimens that we have examined are as follows:

United States: Florida: Monroe Co., Boca Chica, 10 x 70, 29 xii 70, 23 i 71, 27 vi 71, 18 vii 71, W. H. Pierce (3♂, 6♀; FSCA, USNM); Saddlebunch Keys, 20 xii 53, H. V. Weems (3♀; FSCA, USNM); Dade Co., Everglades Nat'l Pk., 8 iii 55, H. A. Denmark (1♂; FSCA).

Bahamas: Cat Island, The Bight, 22 iii 53, Hayden and Giovannoli (1♂; AMNH). Mayaguana Island, near Abraham Bay, 3 iii 53, Hayden (1♂, 1♀; AMNH, USNM). New Providence Island, Nassau, 5 iv 53, Hayden (3♀; AMNH, USNM), 24 ix 60, Babb (1♀; USNM).

Nesopsilopa Species A

fig. 11-12

Diagnosis: This species is very similar to and is considered the “sister-species” of *N. umbrosa*. It is distinguished from *N. umbrosa* as follows: Length 2.65 mm; face narrow, head-width to face-width ratio 1 : 0.31; costal vein index 1 : 0.55; M1 + 2 vein index 1 : 0.61; male genitalia as in fig. 11-12.

Remarks: This species is known only from a single specimen from Florida (Key West, 20 July 1939, R. H. Beamer, USNM). Fortunately,

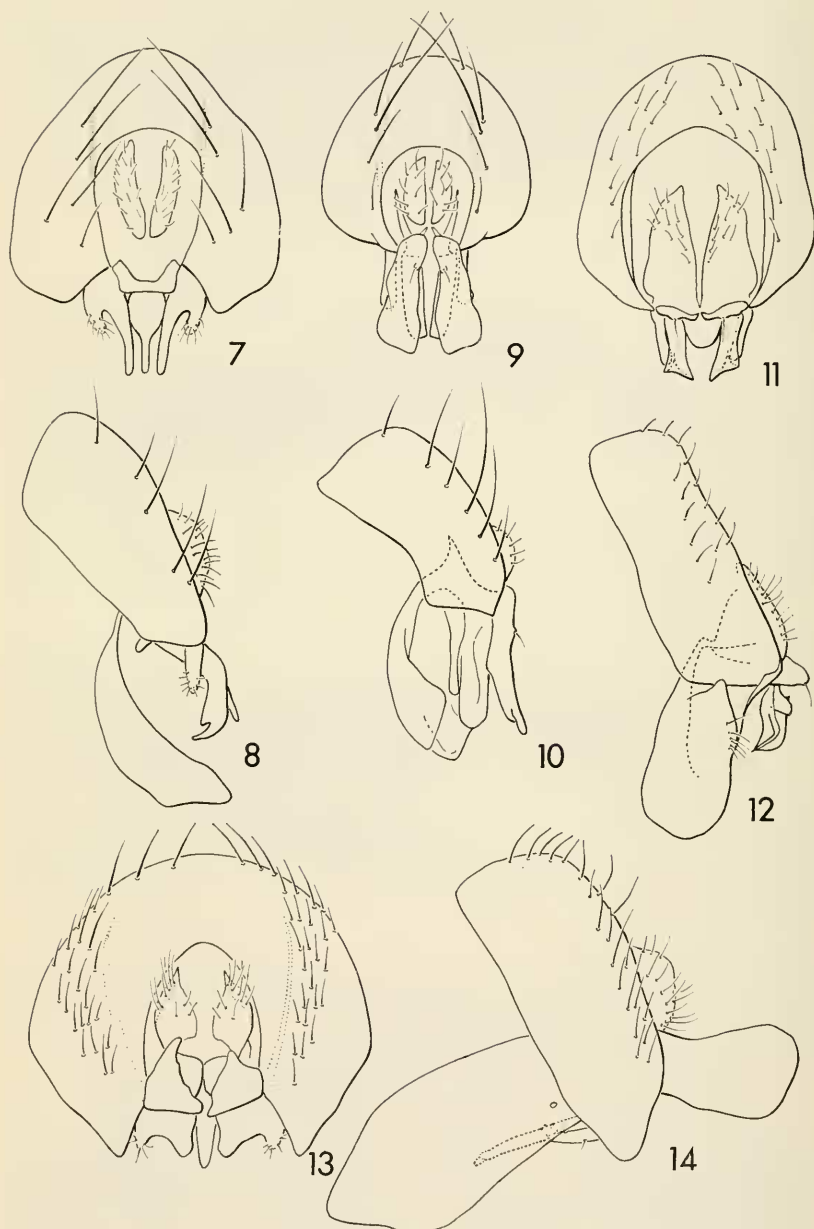


Fig. 7-14, male genitalia. 7, *Guttipsilopa haydeni*, ventral view. 8, same, lateral view. 9, *Nesopsilopa umbrosa*, ventral view. 10, same, lateral view. 11, *Nesopsilopa* species A, ventral view. 12, same, lateral view. 13, *Nesopsilopa stonei*, ventral view. 14, same, lateral view.

the only specimen is a male, enabling confirmation of its species identity by the many structural characters of the genitalia. However, we are refraining from describing it now due to its very poor general condition.

Guttipsilopa Wirth

Guttipsilopa Wirth, 1956:9. Type-species: *Guttipsilopa haydeni* Wirth, by original designation.

Diagnosis and Description: *Guttipsilopa* is distinguished from related genera of the subfamily Psilopinae by the diagnosis and description given for *Nesopsilopa* with the following additions: Length approximately 2.50 mm; wing guttate; ocellar bristles arising laterad of anterior ocellus; antennal arista with 6 branches; face narrow; 2 pairs of larger facial bristles; vein R2 + 3 short.

Distribution: *Guttipsilopa* is apparently endemic to Andros Island, Bahamas.

Natural History: Nothing is known of the immature stages nor of the habitat of the adults. The species presumably, like those of *Nesopsilopa*, inhabits seashore environments.

Guttipsilopa haydeni Wirth
fig. 6-8

Guttipsilopa haydeni Wirth, 1956:11; Wirth, 1968:8.

Diagnosis: *Guttipsilopa haydeni* is a distinctive species and is easily distinguished by the following characters: Length 2.45 mm; face narrow, head-width to face-width ratio 1 : 0.32; 2 pairs of larger facial bristles, upper pair below middle of face; parafacies very narrow throughout, eye to cheek ratio less than 1 : 0.10; wing (fig. 6) guttate, dark brown, with 4 spots in cell R4 + 5, 2nd basal spot in cell R4 + 5 extending posteriorly around posterior crossvein and into cell M3 + 4, cell M1 + 2 with additional spot near posterior wing margin; costal vein index 1 : 0.84; M1 + 2 index 1 : 0.53; abdomen shining with metallic blackish-blue reflections; male genitalia as in fig. 7-8.

Type and Type-locality: Male holotype: "Andros Island, Fresh Creek, April 23, 1953; Van Voast—A.M.N.H., Bahama Isls. Exped., Coll. E. B. Hayden & L. Giovannoli; *Guttipsilopa haydeni* Wirth HOLOTYPE."

Remarks: The type is pinned with one wing mounted separately on a slide; the abdomen has been removed for dissection of the genitalia which are in a microvial on the pin.

Key to Species of *Nesopsilopa* and to Related Genera

1. Wing guttate, generally dark except for distinct white spots 2
- Wing at most with infuscation along anterior $\frac{1}{2}$, otherwise hyaline 4

2. Postocellars reclinate; alula reduced; base of ocellar bristles aligned caudad of anterior ocellus 3
- Postocellars proclinate; alula normal; base of ocellars aligned laterad of anterior ocellus *Guttipsilopa haydeni* Wirth
3. Gena wide; arista with 8–10 branches; 1 pair of proclinate fronto-orbitals; R2 + 3 normal; supra-alar present; anal angle of wing normal, projecting *Actocetor* Becker
- Gena narrow; arista with 5–6 branches; 2 pairs of proclinate fronto-orbitals; R1 + 3 abruptly shortened and usually with stump vein; supra-alar absent; anal angle of wing not projecting *Trypetomima* de Meijere
4. Postocellars reclinate to diverging; wing hyaline; reclinate fronto-orbital laterad of larger proclinate fronto-orbital *Clasiopella* Hendel
- Postocellars proclinate; anterior margin of wing infuscated; reclinate fronto-orbital caudad of larger proclinate fronto-orbital *Nesopsilopa*, new genus... 5
5. Abdomen shining, metallic bluish black; anterior margin of wing very dark, dark brown; posterior crossvein whitish; arista with 8–9 branches 6
- Abdomen subshining to shining, brownish black; anterior margin of wing only slightly darkened, light brown; posterior crossvein brownish; arista with 5–6 branches 8
6. Face relatively wide, head-width to face-width ratio averaging 1 : 0.39; costal vein index 1 : 0.47; larger species, length 3.5–4.0 mm 7
- Face relatively narrow, head-width to face-width ratio averaging 1 : 0.31; costal vein index 1 : 0.62; smaller species, length 3.0 mm *Nesopsilopa stonei*, new species
7. Scutellum dark brown; posterior margin of wing infuscation sinuate, distinct *Nesopsilopa caeruleiventris* (Loew)
- Scutellum concolorous with mesonotum, gray; posterior margin of wing infuscation indefinite, blending gradually with hyaline area *Nesopsilopa bahamaensis*, new species
8. Face relatively narrow, head-width to face-width ratio 1 : 0.31; costal vein index 1 : 0.55; smaller species, length 2.65 mm *Nesopsilopa* species A
- Face relatively wide, head-width to face-width ratio 1 : 0.40; costal vein index 1 : 0.67; larger species, length 2.73–3.07 mm *Nesopsilopa umbrosa* (Loew)

GENERAL DISCUSSION

The tribal classification of the genera herein considered is as yet unresolved. The present distinguishing characters, used either singly or together, cannot be universally applied. Cresson (1942) erected the tribes Discocerini and Psilopini in his key to the North American species of Psilopinae. Psilopini was distinguished from Discocerini by the following characterization:

“Ocellars situated caudad of line of anterior ocellus, sometimes between the posterior ocelli, far caudad of line of frontals and frontorbitals (the latter sometimes weak); antennae generally of the complex Notiphiline type; mostly shining to polished species.”

Guttipisilopa and some *Nesopsilopa* agree with Cresson's definition of Psilopini in the first two characters but these genera are pollinose over much of the dorsal surface. However, *Nesopsilopa umbrosa* does not agree in any of the characters. The basal insertion of the ocellars is aligned cephalad of the anterior ocellus, arisal branches average 5 (Gymnopine type), and the mesonotum and head are densely pollinose.

Both *Guttipisilopa* and *Nesopsilopa* belong to an assemblage of genera, including Psilopini (sensu Cresson) that can be distinguished from the "Discocerini" by the well-developed prescutellars which are widely separated, and well forward (approximately in line or anterior to the alignment of the intra-alars). Further, most genera of "Psilopini" (group A) are recognizable by the larger proclinate fronto-orbital being laterad of the reclinate fronto-orbital; by the sparsely setulose disc of the scutellum; by the reduced or absent postocellars, which if present are lateroclinate; and by the lack of a supra-alar. The remaining genera (group B) of this assemblage resemble the "Discocerini" and can generally be characterized by the following: Reclinate fronto-orbital behind larger proclinate fronto-orbital; postocellars relatively large, proclinate-diverging; scutellum setulose; and dorsum of the thorax and head densely pollinose. However, several genera of the assemblage possess character states of both groups, i.e. *Rhyssophora*, *Trypetomima*, and *Clasiopella*. We feel that these genera as well as most of the genera of the assemblage are valid, being recognizable by derived character states, but the groupings of genera are unsatisfactory. Which character states are the result of convergences, reversals, etc. are unsettled questions.

Discocerini and Psilopini must either be characterized again, using discrete characters and/or perhaps with different generic complements, or the two tribes should be combined. We favor the latter, but reserve a more definitive judgement until the entire complex can be studied thoroughly, especially their male genitalic characters.

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